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(71) Applicant(s):
The CDA Group Limited
(Incorporated in the United Kingdom)
Unit 1, Harrimans Lane, Dunkirk,
NOTTINGHAM, NG7 2SD, United Kingdom

(72) Inventor(s):
Ian Nigel Ratcliffe Kershaw

(74) Agent and/or Address for Service:
Swindell & Pearson
48 Friar Gate, DERBY, DE1 1GY,
United Kingdom

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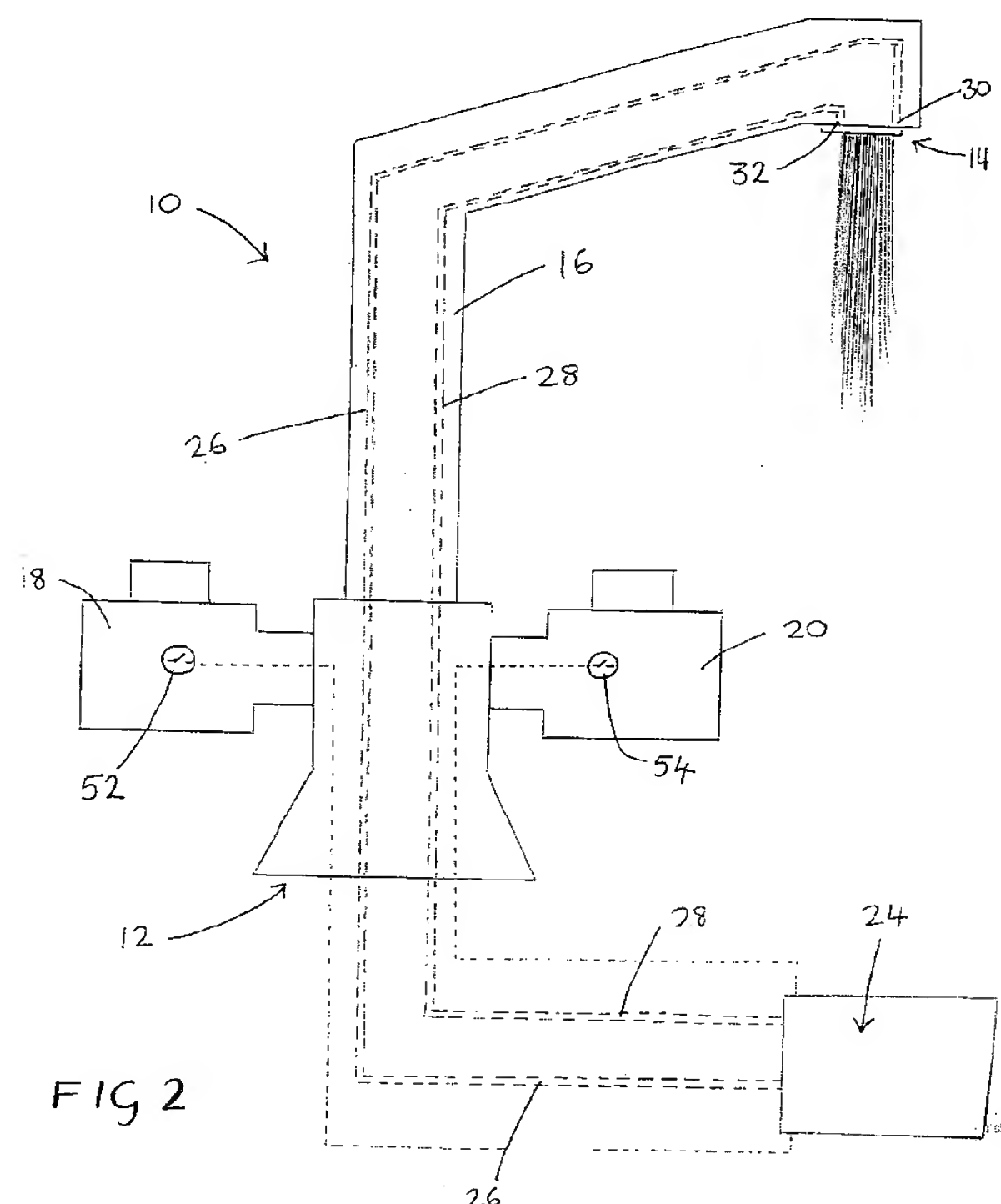
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GB 2288974 A **EP 0446365 A**

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(54) Abstract Title: **Water dispensing device**

(57) A water dispensing device in the form of a tap 10 for connection to a water supply includes means for illuminating water dispensed by the tap 10, the illumination means being capable of producing at least two distinct colours. The tap 10 preferably includes an inlet 12 for connection to the water supply, an outlet 14 from which the water is dispensed and a water flow conduit 16 extending between the inlet 12 and the outlet 14. Preferably, the tap 10 is adapted to dispense both hot and cold water and the illumination means includes means for illuminating hot water with a first colour such as red and cold water with a second colour such as blue.



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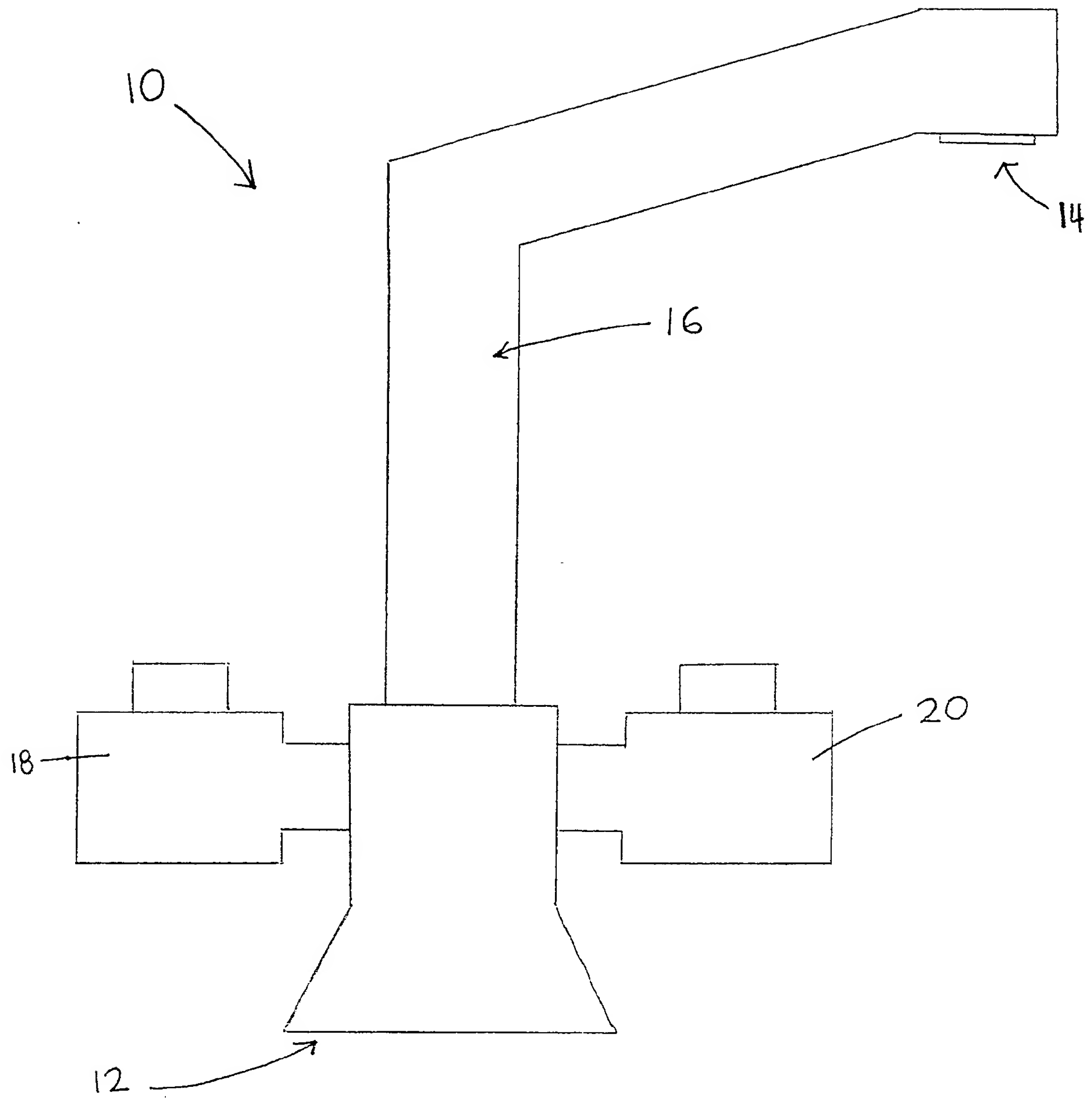
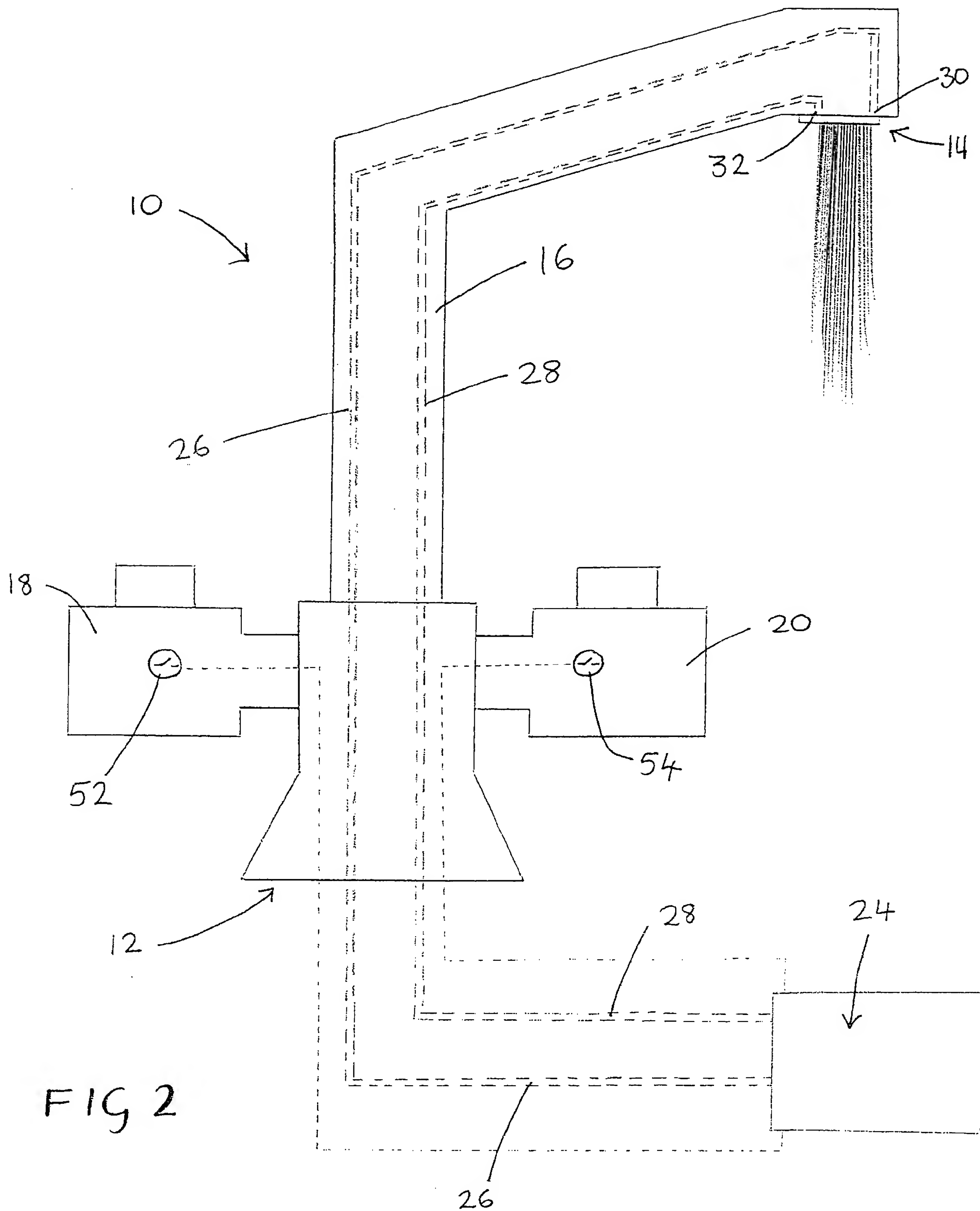
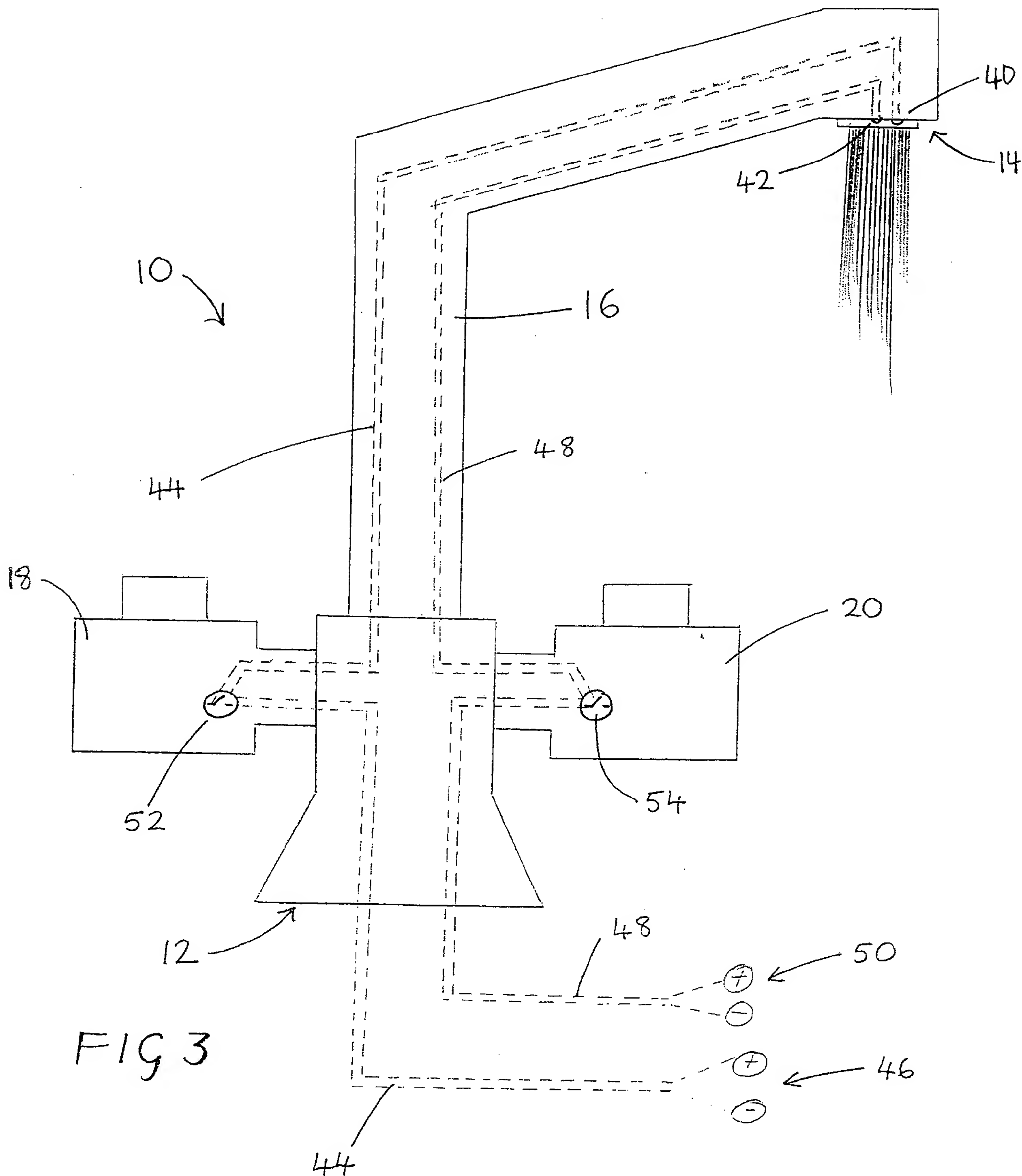


FIG 1





WATER DISPENSING DEVICE

This invention relates to a water dispensing device such as a kitchen or bathroom tap or a showerhead.

According to the invention there is provided a water dispensing device for connection to a water supply, the device including means for illuminating water dispensed by the device, the illumination means being capable of producing at least two distinct colours.

The device preferably comprises a kitchen or bathroom tap or a showerhead.

The water dispensing device preferably includes an inlet for connection to the water supply, an outlet from which the water is dispensed and a water flow conduit extending between the inlet and the outlet. The inlet may be adapted for connection to a water supply in the form of a pipe containing water at pressure.

Preferably the device includes a valve for controlling the flow of water between the inlet and the outlet.

Preferably the device is adapted to dispense both hot and cold water. The inlet may be adapted for connection to separate hot and cold water supplies. Preferably the illumination means includes means for illuminating hot water with a first colour and cold water with a second colour. The first colour may be red and the second colour blue.

Preferably the device includes a manually operable hot water valve which may be opened to allow a flow of hot water from the inlet to the outlet, thereby dispensing hot water from the device. The device preferably further includes a manually operable cold water valve which may be opened to allow a flow of cold water from the inlet to the outlet, thereby dispensing cold water

from the device. Preferably the device includes means for automatically causing the illumination means to produce illumination of the first colour when the hot water valve is opened to cause the flow of hot water and illumination of the second colour when the cold water valve is opened to cause the flow of cold water.

The device may include means for sensing the temperature of water flowing from the outlet and causing the illumination means to produce illumination of a selected one of a number of different colours, depending upon the temperature of the water.

The device may include a light source remote from the outlet and an optical fibre extending from the light source to the outlet, to provide illumination of water being dispensed from the device. The optical fibre may extend through or parallel to the water flow conduit. Preferably the device includes a plurality of optical fibres extending from the light source to the outlet.

The light source may include means for producing white light, and a plurality of filters for colouring the light. The light source may include an optical fibre colour wheel.

Preferably the light source includes a blue filter and an associated optical fibre or bundle of optical fibres for blue light. Preferably the light source further includes a red filter and an associated optical fibre or bundle of optical fibres for red light. The light source may include a plurality of filters for different colours and an optical fibre or bundle of optical fibres associated with each filter.

Alternatively, the device may include a single optical fibre or bundle of optical fibres, the colour of light conveyed by the fibre or fibres being altered by adjustment of the filter.

The device preferably includes a microswitch associated with each of the manually operable hot water and cold water valves, the microswitch being closed when the valve is opened to cause the flow of water, closing of the microswitch causing red or blue light respectively to be transmitted to the outlet.

Alternatively, the device may include a light source located in the outlet. Preferably the device includes at least two light omitting diodes located in the outlet, one producing red light and one producing blue light. The device may include a power source remote from the outlet and means for transmitting power from the power source to the light omitting diodes.

The device preferably includes a microswitch associated with each of the manually operable hot water and cold water valves, the microswitch being closed when the valve is operated to cause the flow of water, closing of the microswitch causing transmission of power to the light omitting diode associated with that valve.

An embodiment of the invention will be described for the purpose of illustration only with reference to the accompanying drawings in which:

Fig. 1 is a diagrammatic vertical section of a conventional tap;

Fig. 2 is a diagrammatic vertical section of a tap according to a first embodiment of the invention; and

Fig. 3 is a diagrammatic vertical section of a tap according to a second embodiment of the invention.

Referring to Fig. 1, a conventional water dispensing device in the form of a tap 10 includes an inlet 12 for connection to independent hot and cold water supply pipes (not illustrated). The water supply pipes may include mains water (which may be heated for example by a combination boiler) or water from

elevated hot/cold water tanks.

The tap 10 further includes an outlet 14 from which water is dispensed and a conduit 16 extending between the inlet 12 and the outlet 14.

The tap 10 includes valves (not illustrated) for controlling the flow of hot and cold water through the conduit 16 to the outlet 14 and thereby from the tap. The flow of hot water is controlled by a hot water tap handle 18 and the flow of cold water is controlled by a cold water tap handle 20. Anti-clockwise rotation of the tap handle 18 opens the valve for hot water and results in the flow of hot water through the conduit 16 and out of the tap from the outlet 14. Anti-clockwise rotating of the tap handle 20 similarly results in the flow of cold water from the outlet 14.

Referring to Fig. 2 there is illustrated a tap 10 according to a first embodiment of the invention. The tap includes the same features as described in relation to Fig. 1 and corresponding reference numerals are used. However the tap 10 further includes a light source 24, a first optical fibre 26 and a second optical fibre 28. Both optical fibres extend from the light source 24 to the outlet 14 of the tap 10. An end 30 of the first optical fibre is located in a region of the outlet which dispenses hot water and an end 32 of the second optical fibre is located in a region of the outlet 14 which dispenses cold water.

The light source 24 comprises an optical fibre box which produces white light but which includes a standard optic fibre colour wheel (not illustrated). The colour wheel includes red and blue filters, light passing through the red filter subsequently being transmitted through the first optical fibre 26 and light passing through the blue filter subsequently travelling through the second optical fibre 28. Thus, red light may be omitted from the end 30 of the first optical fibre and blue light from the end 32 of the second optical fibre.

The hot water tap handle 18 includes a microswitch 52 which is closed when the tap handle is rotated to turn on the hot water. When this switch is

closed, an electrical signal is passed to the light source 24, this signal activating a switch which causes red light to be transmitted down the first optical fibre 26. The cold water tap handle 20 includes a corresponding microswitch 54 which, when closed, passes a signal down a line 36 to activate a switch within the light source. This causes blue light to be transmitted down the optical fibre 28.

The tap operates as follows. When the hot and cold water tap handles 18 and 20 are off and no water flows, the microswitches within the tap handles are open and therefore the light source 24 is not triggered to provide light for either the first or second optical fibres 26 or 28. If the hot water tap handle 18 is rotated anti-clockwise to turn on the flow of hot water, this activates the microswitch therein and also activates the light source 24 to produce red light down the first optical fibre 26. If the cold water tap handle 20 is rotated anti-clockwise to turn on the flow of cold water, this activates the microswitch in the cold water tap handle and activates the light source to produce blue light down the second optical fibre 28.

When water flows from the outlet 14, the light from the optical fibres is scattered by the water flow and therefore appears to colour the water. Hot water is therefore coloured red and cold water is coloured blue. If both hot water and cold water flow simultaneously, both red and blue light will appear and some water will appear red and some blue, giving an overall purple effect.

Referring to Fig. 3, there is illustrated a further embodiment of the invention in which corresponding parts are given the same reference numerals. In this embodiment, instead of the optical fibres, the tap 10 is provided with a red light emitting diode (LED) 40 and a blue LED 42 located in the outlet 14 of the tap. The red LED is located in a region of the outlet 14 from which hot water flows and the blue LED in a region of the outlet 14 from which blue water flows. The red LED 40 is connected by electrical wiring 44 to a power source 46 and a blue LED 42 is connected by electrical wiring 48 to a power source 50.

A microswitch 52 is located in the region of the hot water tap handle 18.

The microswitch 52 interrupts the wiring 44 extending between the red LED 40 and the power source 46. When the hot water tap handle 18 is rotated anti-clockwise to turn the hot water on, this closes the microswitch and thereby provides power to the red LED. A microswitch 54 located in the cold water tap handle 20 performs a similar function for cold water. Therefore, when the hot water is turned on, the red LED lights up and the light is scattered by the water flow thus appearing to colour the water red. When the cold water tap handle 20 is rotated to turn the cold water on, the blue LED 42 lights up thus appearing to colour the water to blue.

There is thus provided a tap in which the water flowing therefrom may be coloured to indicate its temperature or merely for decoration. Although preferably red water is coloured hot and blue water blue, this is not essential and different colours could be used for decorative purposes, for example to match a user's kitchen or bathroom. This tap has significant aesthetic appeal over conventional taps and also has a safety advantage as hot water may be coloured red and therefore cannot be mistaken for cold water.

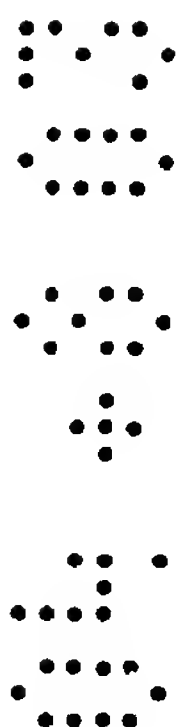
Various modifications may be made to the above described embodiments without departing from the scope of the invention. For example, the tap could include a temperature sensor located in its outlet, for sensing the temperature of the water leaving the outlet of the tap. Depending upon the temperature, the light provided at the outlet could be varied in colour.

The invention is applicable to kitchen and bathroom taps and to shower-heads and essentially to any device for providing a flow of water, particularly in a domestic situation.

Whilst endeavouring in the foregoing specification to draw attention to those features of the invention believed to be of particular importance it should be understood that the Applicant claims protection in respect of any patentable feature or combination of features hereinbefore referred to and/or shown in the drawings whether or not particular emphasis has been placed thereon.

CLAIMS

1. A water dispensing device for connection to a water supply, the device including means for illuminating water dispensed by the device, the illumination means being capable of producing at least two distinct colours.
2. A water dispensing device according to claim 1, wherein the device comprises a kitchen or bathroom tap or a showerhead.
3. A water dispensing device according to claim 1 or claim 2, wherein the device includes an inlet for connection to the water supply, an outlet from which the water is dispensed and a water flow conduit extending between the inlet and the outlet.
4. A water dispensing device according to claim 3, wherein the inlet is adapted for connection to a water supply in the form of a pipe containing water at pressure.
5. A water dispensing device according to claim 3 or claim 4, wherein the device includes a valve for controlling the flow of water between the inlet and the outlet.
6. A water dispensing device according to any of claims 3 to 5, wherein the device is adapted to dispense both hot and cold water.
7. A water dispensing device according to claim 6, wherein the inlet is adapted for connection to separate hot and cold water supplies.
8. A water dispensing device according to claim 6 or claim 7, wherein the illumination means includes means for illuminating hot water with a first colour and cold water with a second colour.
9. A water dispensing device according to claim 8, wherein the device includes a manually operable hot water valve which may be opened to allow a flow of hot water from the inlet to the outlet, thereby dispensing hot water from the device, and a



manually operable cold water valve which may be opened to allow a flow of cold water from the inlet to the outlet, thereby dispensing cold water from the device.

10. A water dispensing device according to claim 9, wherein the device includes means for automatically causing the illumination means to produce illumination of the first colour when the hot water valve is opened to cause the flow of hot water and illumination of the second colour when the cold water valve is opened to cause the flow of cold water.

11. A water dispensing device according to any of claims 3 to 10, wherein the device includes means for sensing the temperature of water flowing from the outlet and causing the illumination means to produce illumination of a selected one of a number of different colours, depending upon the temperature of the water.

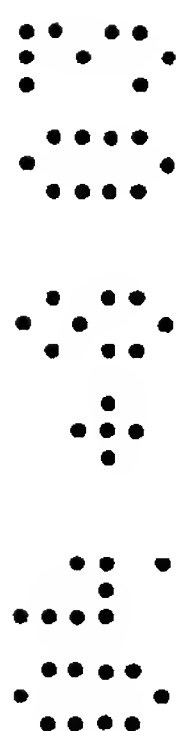
12. A water dispensing device according to any of claims 3 to 11, wherein the device includes a light source remote from the outlet and an optical fibre extending from the light source to the outlet, to provide illumination of water being dispensed from the device.

13. A water dispensing device according to claim 12, wherein the optical fibre extends through or parallel to the water flow conduit.

14. A water dispensing device according to claim 12 or claim 13, wherein the device includes a plurality of optical fibres extending from the light source to the outlet.

15. A water dispensing device according to any preceding claim, wherein the light source includes means for producing white light, and a plurality of filters for colouring the light.

16. A water dispensing device according to claim 15, wherein the light source includes an optical fibre colour wheel.



17. A water dispensing device according to claim 15 or claim 16, wherein the light source includes a blue filter and an associated optical fibre or bundle of optical fibres for blue light and a red filter and an associated optical fibre or bundle of optical fibres for red light.

18. A water dispensing device according to claim 17, wherein the light source includes a plurality of filters for different colours and an optical fibre or bundle of optical fibres associated with each filter.

19. A water dispensing device according to claim 17, wherein the device includes a single optical fibre or bundle of optical fibres, the colour of light conveyed by the fibre or fibres being altered by adjustment of the filter.

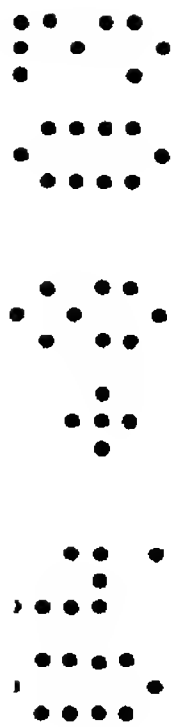
20. A water dispensing device according to claim 8, wherein the device includes a microswitch associated with each of the manually operable hot water and cold water valves, the microswitch being closed when the valve is opened to cause the flow of water, closing of the microswitch causing red or blue light respectively to be transmitted to the outlet.

21. A water dispensing device according to claim 8, wherein the device includes a light source located in the outlet.

22. A water dispensing device according to claim 21, wherein the device includes at least two light emitting diodes located in the outlet, one producing red light and one producing blue light.

23. A water dispensing device according to claim 22, wherein the device includes a power source remote from the outlet and means for transmitting power from the power source to the light emitting diodes.

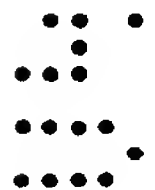
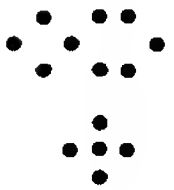
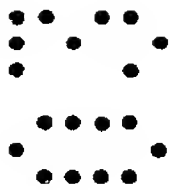
24. A water dispensing device according to claim 8, wherein the device includes a microswitch associated with each of the manually operable hot water and cold water valves, the microswitch being closed when the valve is operated to cause the flow of



water, closing of the microswitch causing transmission of power to the light emitting diode associated with that valve.

25. A device substantially as hereinbefore described with reference to the accompanying drawings.

26. Any novel subject matter or combination including novel subject matter disclosed herein, whether or not within the scope of or relating to the same invention as any of the preceding claims.





Application No: GB 0219997.4
Claims searched: 1-24

Examiner: D. Haworth
Date of search: 23 January 2004

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1-14 at least	GB 2288974 A (Lin Li) - whole doc.
X	1 at least	EP 0446365 A (Inax) - see especially lines 8-14 in column 3

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	F	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^w:

A4N

Worldwide search of patent documents classified in the following areas of the IPC⁷:

E03C

The following online and other databases have been used in the preparation of this search report:

WPI, EPODOC, PAJ